



Biosafety Risk Assessment

Characterize biological agents and laboratory activities

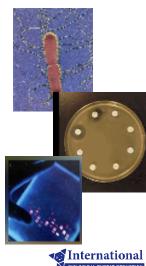
- a. Evaluate the specific biologic agent hazards
- b. Evaluate laboratory procedure hazards
- c. Evaluate in-place hazard mitigation measures

2. Evaluate scenarios

- a. Create scenarios consisting of the specific agent and specific laboratory procedures
- b. Determine the likelihood of exposure based upon the procedure and the likelihood of infection based upon the agent as related to the method of exposure

Characterize the risk

- a. Evaluate the overall likelihood and consequences of each scenario
- b. Determine acceptable and unacceptable risks; develop risk statement







Class Activity: Brainstorming Risk Assessment Criteria

- On the worksheet, list criteria that you think would be important for biosafety risk assessment
 - Identify whether each criterion impacts the likelihood (probability), consequences, or both for biosafety risks
 - If you were doing a risk assessment, identify who you might have help you
 evaluate each criterion
- Example:

	Biosafety			Biosecurity			
Criterion	L	С	Both	L	С	Both	Who would you ask for help in evaluating this criterion?
Biological Agents							
4. Morbidity		x			х		scientist
5. Mortality		x			х		scientist
6. Routes of Infection	х			x			scientist

International





Biosafety Risk Assessment: Characterize the Biological Agents

- What is known about the agent?
 - Pathogenicity ability to cause disease
 - Virulence degree of pathogenicity
 - · Host range restricted or broad, human, animals, plants
 - Communicability are there reports of epidemics? Of laboratory infections?
 - Transmission means (e.g., direct contact, vector borne) and routes (e.g., ingestion, inhalation)
 - Environmental stability e.g., resistance to disinfection
- Additional agent factors:
 - Toxicity
 - Is the agent associated with cancer (e.g., Hepatitis B virus associated with liver cancer)?
 - Does the agent or by-products induce allergic reactions (e.g., Penicillin)?





Biosafety Risk Assessment: Characterize the Laboratory Procedure Hazards

- Does the environment or activity change the risk?
 - · Laboratory versus field studies
 - · Animal studies?
 - · Procedures
 - Do planned experiments have the potential to generate aerosols?
 - · Equipment
 - Needles
 - Centrifuges
 - Homogenizers
 - Pipettes





Biosafety Risk Assessment: Consider Personnel Doing the Work

- Are their host factors that change the risk?
 - Deficiencies in host defenses
 - · Pre-existing medical conditions for example:
 - · Asplenia, eczema
 - · Reproductive hazards
 - Pregnancy, teratogens, mutagens for example:
 - Rubella, Toxoplasma, Chlamydia
 - · Allergies
 - Foreign proteins, vaccine constituents, antimicrobial therapies for example:
 - · Animal dander, egg proteins, latex
 - · Immunization status
 - · Immunization against workplace pathogens, but ...
 - Not always the answer (vaccine efficacy, safety issues)
 - · Behavioral elements
 - Education, training, experience, motivation, attentiveness



